

CLAIMS:

1. A method of replicating multicast datagrams in a network device, said method comprising:

determining by a memory management unit whether a scheduled outgoing datagram stored in a main memory is a multicast (MC) packet;

5 when the scheduled outgoing datagram type is the MC datagram:

performing a lookup of a replicate count table to determine a copy count value and writing the copy count value to a copy count register;

awaiting a ready signal from an egress port of the network switch;

10 sending the outgoing datagram to the egress port from the main memory along with the copy count value;

changing the copy count value in the copy count register;

modifying a VLAN identifier of the outgoing datagram if necessary based on the copy count value; and

forwarding the outgoing datagram from the egress port.

2. A method as recited in claim 1, wherein the method performed by the memory management unit is suspended based on a presence of a higher-priority outgoing datagram.

3. A method as recited in claim 1, further comprising steps of waiting until the copy count value in the copy count register is zero and releasing a pointer to a memory location of the outgoing datagram in the main memory.

4. A method as recited in claim 1, wherein the step of performing the lookup
of the replicate count table comprises determining a pointer based on the group
number and using that pointer as an index for the replicate count table to perform the
5 lookup.

5. A method as recited in claim 4, wherein the step of sending the outgoing
datagram comprises:

reading a first portion of the datagram from the main memory;
5 sending the first portion, along with the copy count value and the pointer, to the
egress port;
continuing to read and send subsequent portions of the datagram until a last
portion is read; and
decrementing the copy count value in the copy count register.

6. A method as recited in claim 4, wherein the step of modifying the VLAN
identifier of the outgoing datagram comprises accessing a VLAN ID table using the
pointer as an index to obtain a new VLAN identifier.

7. A method as recited in claim 7, wherein the new VLAN identifier is
obtained from a bit value in an entry in the VLAN ID table provided by the pointer,
where the bit value is equal to the copy count value.

8. A network device for handling datagrams in a network, comprising:
a main memory;
a memory management unit;

determining means for determining whether a scheduled outgoing datagram
5 stored in the main memory is a multicast (MC) datagram;

performing means for performing a lookup of a replicate count table to
determine a copy count value and writing the copy count value to a copy count
register;

awaiting means for awaiting a ready signal from an egress port of the network
10 switch;

sending means for sending the outgoing datagram to the egress port from the
main memory along with the copy count value;

changing means for changing the copy count value in the copy count register;

modifying means modifying a VLAN identifier of the outgoing datagram if
15 necessary based on the copy count value; and

forwarding means for forwarding the outgoing datagram from the egress port.

wherein the performing, awaiting, sending, changing, modifying and
forwarding means are configured to be activated when the scheduled outgoing
datagram type is the MC datagram.

9. A network device as recited in claim 8, further comprising suspending
means for suspending a replication operation of the memory management unit based
on a presence of a higher-priority outgoing datagram.

10. A network device as recited in claim 8, further comprising waiting means
for waiting until the copy count value in the copy count register is zero and releasing
means for releasing a pointer to a memory location of the outgoing datagram in the

5 main memory.

11. A network device as recited in claim 8, wherein the performing means comprises second determining means for determining a pointer based on the group number and implementing means for implementing that pointer as an index for the
5 replicate count table to perform the lookup.

12. A network device as recited in claim 11, wherein the sending means comprises:

reading means for reading a first portion of the datagram from the main
5 memory;

second sending means for sending the first portion, along with the copy count value and the pointer, to the egress port; and

decrementing means for decrementing the copy count value in the copy count register;

10 wherein the reading and second sending means are configured to continue to read and send subsequent portions of the datagram until a last portion is read.

13. A network device as recited in claim 11, wherein the modifying means comprises accessing means for accessing a VLAN ID table using the pointer as an index to obtain a new VLAN identifier.

14. A network device as recited in claim 17, wherein the new VLAN identifier is obtained from a bit value in an entry in the VLAN ID table provided by the pointer, where the bit value is equal to the copy count value.

15. A network device for handling datagrams, comprising:

at least one data port interface, said at least one data port interface supporting a plurality of data ports transmitting and receiving datagrams;

5 a memory management unit, in communication with said at least one data port interface; and

a main memory, said main memory communicating with said at least one data port interface and controlled by the memory management unit;

wherein the memory management unit is configured to determine whether a
10 scheduled outgoing datagram stored in the main memory is a multicast (MC) datagram;

wherein when the scheduled outgoing datagram is of a type that is the MC datagram, the memory management unit is configured to perform a lookup of a replicate count table to determine a copy count value, configured to write the copy
15 count value to a copy count register, configured to send the outgoing datagram to the egress port from the main memory along with the copy count value, configured to change the copy count value in the copy count register; and

wherein the at least one data port interface is configured to modify a VLAN identifier of the outgoing datagram if necessary based on the copy count value and
20 configured to forward the outgoing datagram from the egress port.

16. A network device as recited in claim 15, wherein the memory management unit is configured to suspend the replication of the outgoing datagram based on a presence of a higher-priority outgoing datagram.

17. A network device as recited in claim 15, wherein the memory management unit is configured to wait until the copy count value in the copy count register is zero before releasing a pointer to a memory location of the outgoing datagram in the main
5 memory.

18. A network device as recited in claim 8, wherein the memory management unit is configured to determine a pointer based on a group number and and configured to implement that pointer as an index for the replicate count table to perform the
5 lookup.